

CLAIMS

1. A diesel engine comprising:
a fuel supply passage via which fuel is supplied from a fuel tank to an oil pan
5 through a supply pump;
a lubrication-system fuel supply passage via which fuel is supplied from the oil
pan to engine parts to be lubricated through a lubricating oil pump; and
an injection-system fuel supply passage via which fuel is supplied from the oil
pan to an injection system through an injection pump.

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2. The diesel engine as claimed in claim 1, further comprising:
a lubrication-system fuel return passage via which return fuel from the engine
parts is returned to the oil pan; and
an injection-system fuel return passage via which return fuel from the injection
15 system is returned to the fuel tank.

3. The diesel engine as claimed in claim 1, further comprising:
a lubrication-system fuel return passage via which return fuel from the engine
parts is returned to the oil pan; and
20 an injection-system fuel return passage via which return fuel from the injection
system is returned to the oil pan.

4. The diesel engine as claimed in claim 1, further comprising:
a lubrication-system fuel return passage via which return fuel from the engine
25 parts is returned to the oil pan; and
an injection-system fuel return passage via which return fuel from the injection
system is returned to an upstream side of the injection pump.

5. The diesel engine as claimed in claim 4, further comprising a filter
30 arranged on an upstream side of the injection pump, wherein the return fuel from the
injection system passes through the filter.

6. The diesel engine as claimed in claim 1, further comprising:
a lubrication-system fuel return passage through via which return fuel from the
35 engine parts is returned to the oil pan; and
an injection-system fuel return passage through which return fuel from the

injection system passes,

wherein the injection-system fuel return passage includes a three-way valve having an adjustable degree of opening, a first passage via which the return fuel distributed by the three-way valve is returned to an upstream side of the injection pump, and a second
5 passage via which the return fuel distributed by the three-way valve is returned to the oil pan.

7. The diesel engine as claimed in claim 6, further comprising a filter provided between the three-way valve and the injection pump.

10 8. The diesel engine as claimed in claim 6 or 7, wherein the three-way valve supplies the return fuel toward the injection pump with an increased ratio when the diesel engine is warmed up, and supplies the return fuel toward the oil pan with an increased ratio when the engine is cold.

15 9. The diesel engine as claimed in claim 2 or 3, wherein the injection-system fuel supply passage includes a three-way valve having an adjustable degree of opening, and a fuel pipe for a supply of fuel from the fuel tank is connected to the three-way valve.

20 10. The diesel engine as claimed in claim 9, further comprising a filter provided between the three-way valve and the injection pump.

25 11. The diesel engine as claimed in claim 9 or 10, wherein the adjustable degree of opening of three-way valve depends on the temperature of fuel.

30 12. The diesel engine as claimed in claim 3, wherein the injection-system fuel return passage returns the return fuel to given parts among the engine parts before returning the return fuel to the oil pan.

13. The diesel engine as claimed in claim 12, wherein the return fuel is returned to a valve train system, and the fuel passing through the lubrication-system fuel supply passage is supplied to a cylinder block.

35 14. The diesel engine as claimed in claim 1, further comprising:
a lubrication-system fuel return passage via which return fuel from the engine

parts is returned to the oil pan; and

an injection-system fuel return passage through which return fuel from the injection system passes,

5 wherein the injection-system fuel return passage includes a three-way valve having an adjustable degree of opening, a first passage via which the return fuel distributed by the three-way valve is returned to the oil pan, and a second passage via which the return fuel distributed by the three-way valve is returned to the fuel tank.

10 15. The diesel engine as claimed in claim 14, wherein the return fuel from the injection system is returned, via the first passage, to the oil pan via given parts among the engine parts.

15 16. The diesel engine as claimed in any of claims 1 to 15, wherein a suction port of the injection-system fuel supply passage in the oil pan is located at a position higher than that at which a suction port of the lubrication-system fuel supply passage is located.

17. The diesel engine as claimed in any of claims 1 to 16, wherein:
the supply pump in the fuel supply passage is a mechanical supply pump driven by a crankshaft;
20 a three-way valve and a regulator are arranged in this order toward a downstream side from the mechanical supply pump; and
a return pipe is arranged via which excessive fuel from the mechanical supply pump is returned to an upstream side of the mechanical supply pump by controlling the adjustable degree of opening of the three-way valve.

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18. The diesel engine as claimed in any of claims 1 to 16, wherein the supply pump is an electrically powered pump, and a discharge amount of the electrically powered pump is controlled based on an engine condition.

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